

WHAT IS CLAIMED IS:

1. A method of fabricating an X-ray detecting device, comprising the steps of:

providing a thin film transistor and a lower electrode of a storage capacitor on a substrate;

providing an inorganic insulating film over the thin film transistor and over the lower electrode;

providing an organic insulating film over the inorganic insulating film; and

dry etching the organic insulating film and the inorganic insulating film using a mixed ratio gas that etches the organic insulating film faster than the inorganic insulating film.
2. The method according to claim 1, wherein an etching rate of the organic insulating film is greater than that of the inorganic insulating film.
3. The method according to claim 1, wherein the mixed ratio gas contains SF₆, O₂, O₂+ Cl₂ and CF₄.
4. The method according to claim 3, wherein a component ratio of SF₆ to O₂ is about 1:3.
5. The method according to claim 1, further comprising the steps of:

patterning the inorganic insulating film and the organic insulating film to provide a storage insulating film and a first protective film;

forming a transparent electrode on the first protective film;

forming a second protective film on the first protective film; and

providing a pixel electrode on the second protective film.

6. The method according to claim 1, wherein said step of providing the thin film transistor includes:

forming a gate electrode on the substrate;

forming a gate insulating film over the substrate and over the gate electrode;

forming a semiconductor layer on the gate insulating film; and

forming source and drain electrodes on the semiconductor layer.

7. The method according to claim 1, wherein the inorganic insulating film is made from any one of silicon nitride (SiN_x) and silicon oxide (SiO_x).

8. The method according to claim 1, wherein the organic insulating film is made from any one of an acrylic organic compound, Teflon, BCB (benzocyclobutene), Cytop and PFCB (perfluorocyclobutane).

9. A method of fabricating a semiconductor assembly, comprising the steps of:

providing a thin film transistor and a lower electrode of a storage capacitor on a substrate;

providing a first insulating film over the thin film transistor and over the lower electrode;

providing a second insulating film over the first insulating film; and

dry etching the first insulating film and the second insulating film using a mixed ratio gas that etches the second insulating film faster than the first insulating film.

10. The method according to claim 9, wherein the mixed ratio gas contains SF₆, O₂, O₂+ Cl₂ and CF₄.

11. The method according to claim 10, wherein a component ratio of SF₆ to O₂ is about 1:3.

12. The method according to claim 9, further comprising the steps of:

patterning the first insulating film and the second insulating film to provide a storage insulating film and a first protective film;

forming a transparent electrode on the first protective film;

forming a second protective film on the first protective film; and

providing a pixel electrode on the second protective film.

13. The method according to claim 1, wherein said step of providing the thin

film transistor includes:

forming a gate electrode on the substrate;

forming a gate insulating film over the substrate and over the gate electrode;

forming a semiconductor layer on the gate insulating film; and

forming source and drain electrodes on the semiconductor layer.

14. The method according to claim 9, wherein the first insulating film is made from any one of silicon nitride (SiN_x) and silicon oxide (SiO_x).

15. The method according to claim 9, wherein the second insulating film is made from any one of an acrylic organic compound, Teflon, BCB (benzocyclobutene), Cytop and PFCB (perfluorocyclobutane).

16. A thin film transistor substrate, comprising:

a thin film transistor on a substrate, said thin film transistor having a gate electrode, a gate insulating film over said gate electrode, a semiconductor layer on said gate insulating film and extending over said gate electrode, and source and drain electrodes over said semiconductor layer;

a first insulating film over said thin film transistor, said first insulating film including a first opening that exposes part of said drain electrode;

a second insulating film over said first insulating film, said second insulting film including a second opening that exposes part of said drain electrode and part of said first insulating film that is adjacent said first opening.

17. A thin film transistor substrate according to claim 16, further including a transparent electrode on second insulating film, wherein said transparent electrode extends into said first opening and said second opening, wherein said transparent electrode is in electrical contact with said drain electrode, and wherein said transparent electrode extends over said first insulating film that is adjacent said first opening.

18. The thin film transistor substrate according to claim 16, wherein said first insulating film is made from any one of silicon nitride (SiN_x) and silicon oxide (SiO_x).

19. The thin film transistor substrate according to claim 16, wherein said second insulating film is made from any one of an acrylic organic compound, Teflon, BCB (benzocyclobutene), Cytop and PFCB (perfluorocyclobutane).

20. The thin film transistor substrate according to claim 16, further including:
a storage capacitor electrode on said substrate, wherein said a first insulating film extends over said storage capacitor electrode, wherein said first insulting film includes a third opening that exposes part of said storage capacitor electrode, wherein said second insulating film includes a fourth opening that exposes part of said storage capacitor electrode and part of said first insulating film that is adjacent said third opening, .and

a conductive element on second insulating film, wherein said conductive element extends into said fourth opening and into third second opening, wherein said conductive element is in electrical contact with said storage capacitor electrode, and wherein said conductive element extends over said first insulating film that is adjacent said third opening.